lems is increasing among health care workers is due to heightened practitioner awareness or is a real phenomenon cannot be addressed directly with existing surveillance data. Nevertheless, the increasingly routine use of latex gloves as part of universal precautions, as well as the use of mass-produced examination gloves with relatively high antigen content, are factors pointing to an increased exposure potential—that is, more health care workers (and others) are wearing latex gloves and are doing so for a greater portion of their workweek.

Allergists and dermatologists first described immediate-onset latex-associated skin reactions in 1980, labeling them as immunoglobulin E–mediated contact urticaria. Subsequently, numerous cases of angioedema, anaphylaxis, rhinoconjunctivitis, and bronchospasm have been ascribed to latex allergy. The Food and Drug Administration did much to increase awareness of this issue when, in 1991, it issued a bulletin describing anaphylactic reactions to rubber-tipped barium enema catheters. This information encouraged anesthesiologists to investigate hitherto-unexplained intraoperative hypotensive events and to conclude that, in some cases, anaphylactic reactions to surgeons' gloves may be responsible. Issues of nonmedical latex exposure (for example, to condoms, chewing gum, and balloons) and of cross-reactivity with some foods (bananas, avocados, kiwi fruit, chestnuts, and others) have also been identified. Considerable effort has subsequently been invested in identifying the responsible antigenic determinants from the sap of the rubber tree, *Hevea brasiliensis*, and in perfecting skin test antigens and in vitro test reagents.

In the workplace—particularly in hospitals—latex allergy can be a vexing problem. First, latex-related skin conditions must be distinguished from more commonly occurring conditions, such as nonspecific glove-related exacerbation of dyshidrotic eczema and atopic dermatitis, and from less common disorders, such as allergic contact dermatitis from rubber accelerators or antioxidants. In making this distinction, the timing and morphology of skin reactions may be helpful, and in vitro diagnostic tests can help confirm latex allergy as part of a diagnostic algorithm. Nevertheless, specialty consultation for skin-prick or patch testing may be needed. For persons with respiratory symptoms, a similar approach is used, with the addition of peak flow measurements to document cross-workshift decrements in pulmonary function.

Once a latex allergy is diagnosed, the affected person must be supplied with appropriate gloves. For a person with atopic dermatitis or dyshidrotic eczema, the use of cloth glove liners is far more important than substituting glove materials. For a person with true latex skin allergy, substitute gloves are available fabricated from a variety of materials, including vinyl (polyvinyl chloride), nitrile (polynitrile), polychloroprene, and substituted polystyrene polymers. The most challenging situation is posed by persons with substantial respiratory symptoms. Cornstarch or talc dust on powdered latex gloves acts as an airborne antigen carrier and can therefore passively trigger respiratory symptoms in persons not wearing such gloves. Thus, in a hospital or clinic environment, it would be desirable to replace all powdered latex gloves with unpowdered, in addition to providing sensitized persons with nonlatex substitutes.

The major barrier to such a strategy at this time is economic. Although no substantial cost differential exists for replacing powdered latex "examination" (nonsterile) gloves with their unpowdered counterparts, a large differential (5 to 6 times the cost) exists for "surgeons'" (sterile) gloves. To dictate that all personnel in a given facility wear either unpowdered latex or nonlatex gloves, whether the persons are latex sensitized or not, may be an expensive step. On the other hand, excluding health care professionals from their customary employment may be an even costlier proposition. Under the Americans with Disabilities Act of 1990, a "qualified individual with a disability" has a right to "reasonable accommodation" with respect to working conditions, while "essential functions" of the job cannot pose an "imminent risk of harm." Accordingly, prudent occupational health practitioners carefully document any decision-making processes that affect the initial or continuing employment status of latex-sensitized workers. In such a climate, it is only a matter of time before market forces eliminate the cost differential between powdered latex surgeons' gloves and their unpowdered (or nonlatex) counterparts.

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REFERENCES

Akasawa A, Hsieh LS, Lin Y: Serum reactivities to latex proteins (*Hevea brasiliensis*). J Allergy Clin Immunol 1995; 95:1196–1205

Kelly KJ, Kurup VP, Reigjula KE, Fink JN: The diagnosis of natural rubber latex allergy. J Allergy Clin Immunol 1994; 93:813–816

Tarlo SM, Sussman G, Contala A, Swanson MC: Control of airborne latex by use of powder-free latex gloves. J Allergy Clin Immunol 1994; 93:985–989

Virant FS: Radiocontrast, local anesthetic, and latex reactions, chap 24, *In* Bierman CW, Pearlman DS, Shapiro GG, Busse WW (Eds): Allergy, Asthma and Immunology From Infancy to Adulthood, 3rd edition. Philadelphia, Pa, WB Saunders, 1996, pp 355-365

Decreasing Work Disability From Asthma

ASTHMA PREVALENCE is increasing, and many cases have occupational and environmental causes. Unlike many other respiratory problems, it affects people during their active working life and can substantially affect their ability to work. The overall cost to patients and employers is great. Public health and clinical approaches can decrease its burden. A notable proportion of asthma is caused by work; this is known as "occupational asthma." It is more frequently of nonoccupational origin, but is aggravated by occupational exposure; this is known as "work-aggravated asthma."

There are two major categories of occupational asthma: "with latency" (delay between exposure and onset) and "without latency." Occupational asthma with latency often depends on the development of antibodies and therefore requires time and repeated exposures to a specific antigenic

agent. Occupational asthma without latency is not allergic in nature. Nonoccupational asthma aggravated by work is due to nonspecific irritant responses. In addition, workers with nonoccupational asthma may have work disability because of an inability to meet a job's physical demands.

Several methods can prevent or limit work disability from occupational asthma with latency: Primary prevention of occupational asthma generally depends on limiting exposures known to cause the asthma. Secondary prevention of occupational asthma depends on early recognition and removing the patient completely from further exposure. In addition, recognizing the disease in one person may allow the complete prevention of it in others by controlling exposures.

Reactions to specific workplace chemical agents (such as latex or diisocyanates) may develop in sensitized persons with exposure to extremely low levels (parts per billion). Secondary prevention—early recognition of the disease—is particularly important for occupational asthma. Several studies have shown that once occupational asthma with latency begins, a delay in removing the worker from further exposure worsens the prognosis for recovery. Personal socioeconomic factors may interfere with a patient's following the physician's advice about avoiding exposure. The early initiation of vocational retraining can substantially decrease the length and extent of occupational disability. These disorders have major economic effects for patients and employers; early identification by primary practitioners and careful confirmation by physicians with particular skill in occupational and pulmonary medicine can limit both delays and overdiagnosis.

Other approaches are best for limiting disability from occupational asthma without latency and work aggravation of nonoccupational asthma. Good patient education and pharmacologic control of asthma severity are important, but many factors other than disease severity affect work ability and motivation. Asthma without latency is clinically similar to nonoccupational asthma and does not imply sensitization to a specific workplace chemical agent. Persons with occupational asthma without latency may often be accommodated in the workplace by measures such as improved ventilation, good workplace housekeeping practices, and the use of respirators. In addition, modification of the job to decrease peak ventilatory demand is often feasible and may be supported by the Americans with Disabilities Act.

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REFERENCES

Blanc PD, Cisternas M, Smith S, Yelin EH: Asthma, employment status, and disability among adults treated by pulmonary and allergy specialists. Chest 1996; 109:688–696

Chan-Yeung M: ACCP [American College of Chest Physicians] Consensus Statement: Assessment of asthma in the workplace. Chest 1995; 108:1084–1117

Harber P, Fedoruk MJ: Work placement and worker fitness: Implications of the Americans with Disabilities Act for pulmonary medicine. Chest 1994; 105:1564–1571

Venables KM: Prevention of occupational asthma. Eur Respir J 1994; 7:768–778

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